

Research Project Title: Bump at the End of the Bridge: Enhanced Remediation Decision Making via 3D Measurement and Advanced 3D Dynamic Analysis

Purpose of the Project

- The purpose of the project is to provide guidance and to aid TDOT officials in their decision-making process regarding bridge approach slabs and foundation rehabilitation, maintenance, and repair strategies.

Scope and Significance

The scope of the research project includes:

- Develop 3D subsurface maps of bridge approach slabs and foundations using an innovative strategy that combines data from multi-frequency ground penetrating radar (GPR), multi-channel analysis of surface waves (MASW), and spectral analysis of surface waves (SASW).
- Develop 3D finite element (FE) models for selected bridge approach slabs and foundations.
- Provide information on current bridge approach conditions and provide a framework for understanding the nature of root causes for approach slab issues.

Expected Outcomes

The following are expected outcomes of this research project:

- Benefit to TDOT will be guidance on issues ranging from structural rehabilitation, maintenance options, and repair strategies for approach slabs and pavements at bridges.
- Implementing 3D FE models for each bridge approach should provide an understanding of current conditions, provide a framework for predicting long-term issues, and give insights on the nature of root causes for approach slab issues.
- New innovations in developing accurate 3D subsurface maps from a variety of non-destructive measures (GPR, MASW, and SASW).

Time Period

The time period for this project is 24 months beginning January 1, 2019 and ending December 31, 2020.

Contact Information

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